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AUTHOR Sullivan, Joanna
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ABSTRACT

This study compares the critical-reading strategies of 83 good and 72 poor sixth-grade readers and 96 good and 67 poor eighth-grade readers. After reading seven brief passages on social studies and science topics, the students responded to 42 statements that required either the ability to pull facts together and make conclusions based on unstated premises (conclusive type) or the ability to test the veracity and consistency of information in a passage (factual type). Data were analyzed according to the distribution and percentage of errors made. While one prestudy assumption was that poor readers would have more problems with conclusive-type statements, the findings indicate that good and poor readers have similar difficulties in making judgments, not only at the factual level, but also at the conclusive level. Though the study tends to confirm the view that one cannot fractionalize the reading process into a series of skills, the conclusion suggests that teachers develop the following skills within a critical reading strategy: sifting out and simplifying information, comparing statements for consistency, emphasizing the use of qualifying terms, and matching conclusive statements with their supportive examples in the text. (RL)

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Dr. Joanna Sullivan
Reading Consultant
Dept. of Special Education
Ministry of Education
Caracas, Venezuela

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A Comparison of Strategies in Critical Reading of Good and Poor Comprehenders in Sixth and Eighth Grades*

Within the last two decades comprehension research has shifted from an effort to identify skill components (Gray, 1960; Davis, 1941) to an emphasis upon comprehension strategies. In other words, the emphasis has shifted from what one comprehends to how one comprehends. One popular assumption among educators concerning comprehension strategies, is that good readers are able to draw conclusions about information while poor readers are "concrete thinkers" who, at best, can process factual information but are weak at the conclusive level. One purpose of this study is to further explore this assumption.

There is agreement among those experts who have identified comprehension skills that processing factual information and drawing conclusions are separate and distinct skills. In the past, Gans (1940), Piekarz(1956) and Gray(1960), found at least three levels of comprehension: literal, inferential and evaluative. Later studies (Davis, 1972, Lundsteen, 1967 and Peters,1976) continue to support the concept that comprehension re-

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*study conducted at Pennsylvania State University

quires different abilities at different levels. Even at the critical reading level which involves making judgements about what one reads, distinctions are made between factual and conclusive types of processing. Ennis (1962) theorized that critical reading incorporated two dimensions of thinking: the logical dimension, which requires the ability to pull facts together in order to discover unstated premises and conclusions, and the pragmatic dimension, which requires the ability to test the veracity and consistency of information in a passage. Briefly, the logical dimension is concerned with conclusive ideas while the pragmatic dimension is concerned with making judgements about facts.

The present study is designed to shed light on strategies used by good and poor readers in responding to statements within the pragmatic and logical dimensions. Current comprehension research has been focusing upon strategies used to gain meaning (Pearson,1975; Peters, 1976; Golinkoff, 1976). Few studies have been specifically concerned with strategies used in critical reading. The present study is concerned with: (1) determining whether good and poor readers differ in errors on factual-type statements within the pragmatic dimension and conclusive-type statements within the logical dimension; (2) determining whether the patterns if errors of good and

poor readers on statements within both dimensions were the same or different; and (3) identifying statements showing the greatest differences between good and poor readers.

Procedure

Subjects

From a total of 250 sixth-grade pupils and 276 eighth-grade pupils randomly selected from suburban Philadelphia, the final sample comprised 83 good and 72 poor sixth-grade pupils and 96 good and 67 poor eighth-grade pupils who scored within the top and bottom 30% on the STEP Reading Test, From 3A, and were within the IQ range of 90 - 120 on the California Test of Mental Maturity, S Form, Level 2, as shown in figure 1.

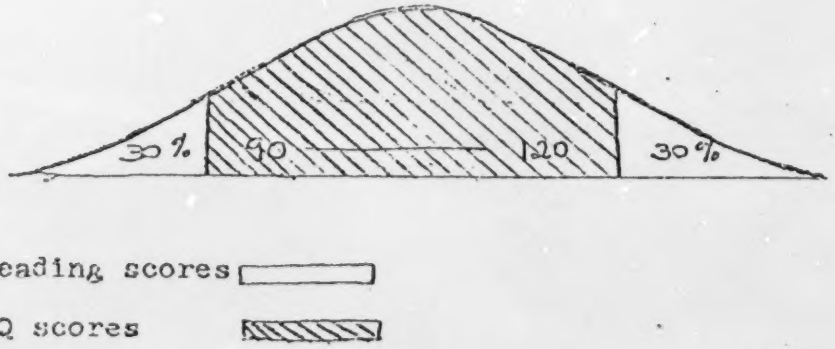

FIG I Sample of good and poor readers within an IQ range of 90 - 120

Measurement of Critical Reading

Critical reading was measured by a test of reading comprehension (Maw, 1959) that had been used by Tate and Straub (1964) and Erginel (1969) in their studies of good and poor problem-solving, and Sullivan (1970) in her study of critical reading abilities. This test consisted of seven brief passages and 42 statements on social studies and science topics. Pupils were to judge whether the factual or conclusive-type statements were true (T), false (F), probably true (PT), probably false (PF) or not enough facts (NE) based upon the information in the passage.

Three judges applied Ennis' criteria to identify 23 logical and 19 pragmatic statement on the critical reading test. Examples of statement within the logical dimension (conclusive-type statements) included:

1. Lightning never strikes twice in the same place.
2. Old habits are easy to bread.
3. Science can solve all of our food problems
4. Patient work brings reward.

Statements within the pragmatic dimension (factual-type statements) include:

1. You will not be struck by lightning if you stay inside a building during a thunder storm.
2. A farmer would not leave a cow tied to a wire fence during a thunder storm.
3. White flour now contains all the food values of whole wheat flour.

k. Some of the ice now in Greenland was there when Columbus discovered America.

Judges agreed that pupils who would have difficulty with the pragmatic dimension would tend to make errors on T, F or NE responses, since pragamatic type statements either support or contradict data in the passage. For example, the factual type statement, Some storms do great damage support the facts embedded in the passage below:

> There are many kinds of storms. Some storms are destructive but most storms are very useful. They help to circulate the air. They bring rain. They clear the air of dirt, soot and smoke.

To avoid errors on pragmatic statements such as the statement above, the reader: (1) should be aware of qualifying terms such as "some," "probably," "more likely" or "not always." These terms appeared on all "true" statements on the critical reading test, (2) the reader must make judgements on false statements containing absolute terms such as "all," "never," "always" and "not." Finally, (3) the reader must be able to match words within the statement and passage that are similar in meaning, such as "great damage" and "destructive" that are mentioned above.

On the other hand, pupils who would have difficulty with conclusive-type statements within the logical dimension such as "Patient work brings reward," would tend to make errors on PT, PF and NE responses. Conclusive statements have

exceptions and tend to partially support information in the passages. Too, the statement "Patient work brings reward" is so general that pupils might substitute their own judgemnts rather than rely upon the information in the passage. One would hypothesize, therefore, that poor readers would have significantly higher percentages of errors than good readers on statements within the logical dimension.

Statistical Treatment

To determine whether good and poor readers differed in the percentages of errors on the critical reading test, the distribution of errors were examined using the chi square technique to determine which statements within each dimension discriminated between good and poor readers. Because the conventional chi square test gives only a rough estimate of the source of interaction between types of errors a method of extending the chi square analysis was applied by partitioning the contingency tables into independent components (Castellan, 1965). This method permitted more precise inference about the interaction between choices of responses by good and poor readers, making it possible to determine whether they made the same type of errors. In addition, statements showing greatest differences between good and poor readers in both grades were examined.

Findings

Although there were significant differences in the number of errors between good and poor readers on more than 80% of the statements at grades six and eight (X^2 ranging from 6.36 - 27.22, $p<.05$, 1df), differences in the percentage of errors between good and poor readers shown in Table 1 were not significant at either grade level, nor between grade levels. Specifically, differences

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Table 1

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in the percentage of errors among good and poor readers at grades six and eight on pragmatic statements was not significant (X^2 3.84, $p>.05$, 1df. at grade six and X^2 1.82, $p>.05$, 1df. at grade eight). Differences in the percentage of errors among good and poor readers on conclusive-type statements within the logical dimension were not significant at either grade level (X^2 1.85, $p>.05$. 1df.)at grade six and X^2 2.66, $p>.05$, 1df. at grade eight). Differences in the percentage of errors between grade levels were even smaller, with chi squares ranging from .052 to .309 ($p>.05$, 1df.) between poor readers in grades six and eight and good readers in both grades. Such findings suggest that good and poor readers, alike, at both grade levels have similar difficulty making judgements at the factual and con-

clusive levels when reading critically. As noted in fig. 2, however, both good and poor readers had a larger percentage of errors within the logical dimension, which is not surprising.

After responses of good and poor readers were partitioned (Castellan X^2) to compare types of errors made by both good and poor readers on pragmatic and logical-type statements, differences in types of errors between groups were not significant on approximately 80% of the statements at both grade levels. At grade six, differences in types of errors between good and poor readers were significant on four of the 23 statements within the pragmatic dimension (X^2 ranging from 5.20 - 16.35, $p<.05$, 1 d.f.) and on only one of the 19 statements within the logical dimension (X^2, 16.35, $p<.01$, 1 d.f.). At grade eight, significnat differences between groups in types of errors were found on four statements within the pragmatic dimension (X^2 ranging from 5.21 - 21.74, $p<.05$, 1 d.f.) and on only two atatements within the logical dimension (X^2 ranging from 5.43 -14.60, $p<.05$, 1 d.f.).

On the few statements in which good and poor readers differed significantly in the types of errors they made, the

majority of sixth-grade poor readers chose T and F rather than PT or PF, while the majority of eighth-grade poor readers chose NE rather than PT or PF responses, as shown in Tables II. In other words, it appeared that differences in errors were

Table II

not due to the dimension in which statements belonged, but to the fine judgments needed in making discriminations between T and PT or F and PF responses. However, since good and poor readers made the same types of errors on approximately 80% of the statements on the critical reading test, findings further support the notion that good and poor readers analyze pragmatic and logical-type statements in a similar manner, with the majority of errors found on PT and PF responses.

Statements showing the greatest differences between good and poor readers are listed below in Tables III and IV. It was not

Tables III and IV

surprising that statements showing greatest differences in the number of correct responses between good and poor readers were within the logical dimension. However, significant differences were found on only 25% of the logical-type statements at grade six and 16% at grade eight.

Conclusions and Implications

Findings tend to dismiss the notion that differences between good and poor readers are based upon the poor readers' lack of ability to process conclusive-type statements. Rather, findings suggest that pragmatic and logical aspects of comprehension overlap -- that processing factual data at the critical reading level is not necessarily a prerequisite to drawing conclusions.

Differences in processing the two types of statements appear to lie in the kind of matching procedure a reader uses when making judgments about statements within these two dimensions. Factual-type statements are matched on the basis of consistency with information in the passage, while conclusive-type statements within the logical dimension are usually matched or supported by examples given in the passage. For example, within the logical dimension, the conclusive statement "Old habits are hard to break" is exemplified by the information in the passage below:

> A number of years ago it was discovered that bread made from whole flour did not contain the vitamins, minerals and proteins that were in whole wheat bread. Many people still used white bread, however, because they had become used to the taste of it.

Within the logical dimension, poor readers had difficulty relating their past knowledge to material they read.

For example, in statement 31, "Cement was discovered by an American scientist" it should be apparent to both good and poor readers that American scientists could not have discovered cement, since America did not exist 2000 years ago when cement was used in Rome. It appears that poor readers skip the important secondary step of making logical deductions that good readers apply to their reading strategy. The deduction in statement 31, is, of course, "Our country is only a few hundred years old. Therefore they could not have helped Rome 2000 years ago."

Perhaps poor readers cannot manipulate such deductions. As Ausubel (1968) points out, the clarity of the content is not the only factor that precludes meaningful learning. That content must be available within the cognitive structure of the learner.

If one were to look at these results in terms of Goodman's "active search process" one would conclude that the poor reader might make tentative choices but neglect the use of various clues to confirm his predictions.

Russell (1964), as well as Tate and Stanier (1959) who studied differences between good and poor problem-solvers, believe that the ability to confirm predictions requires the patience of withholding information in abeyance before making judgments. Results of this study tend to confirm the conclusion that good and poor readers differ in this regard. At the pragmatic level where the reader

attempts to match factual-type statements with information in the passage, he or she is likely to, first, transpose this information and secondly, to identify similarities in word meanings between words in the statement and passage. For example, the statement, "White flour now contains all the food value of whole wheat flour," is consistent, when transposed, with information in the passage:

> Nowdays, some of the minerals and vitamins are added to white flour so people can have white bread if they want it and still get many of the same food values they would get from whole wheat bread.

In an effort to match statement and passage, the reader transposes information by simplifying the statement, which he might do in the following manner:

> "Nowdays, some of (the food value) is added to white flour . . . so people . . . can still get . . . same food value . . as from whole wheat bread."

Poor readers showed a particular lack of ability in transposing information. On statement 39, for example, the reader had to combine the two statements in the passage -- "There is more carbon in hard coal than soft coal. Hard coal burns with almost no smoke and leaves very little ashes" -- in order to conclude that "the less carbon there is in coal the more smoke it makes when it burns." In

general, however, findings show that the skill of transposing information is difficult for good and poor readers, alike.

The results of this study tend to confirm Goodman's belief (1969) that one cannot fractionalize the reading process into a series of skills. It is apparent, however, that readers can be guided to apply such critical reading strategies to:

1) sifting out and simplifying information.
2) checking the consistency of one statement with another.
3) placing emphasis upon qualifying terms such as "not," "almost," "sometimes," or "never."
4) matching conclusive statements with examples leading to such conclusions.

Drawing conclusions from such a study is difficult because, as Simons(1971) points out, "a lack of description of the mental processes involved in comprehending leads to more speculation." Such behaviors as attitude, rigidity and attention which contribute to comprehension ability have not as yet been isolated.

TABLE 1

Percentages of Errors of Good and Poor Readers at Grades Six and Eight on Statements Within the Pragmatic and Logical Dimensions

Statements	Percentages			
	6th Grade		8th Grade	
	Good Rdrs	Poor Rdrs	Good Rdrs	Poor Rdrs
Pragmatic	57.02	64.88	52.96	69.53
Logical	58.66	71.44	54.12	67.70

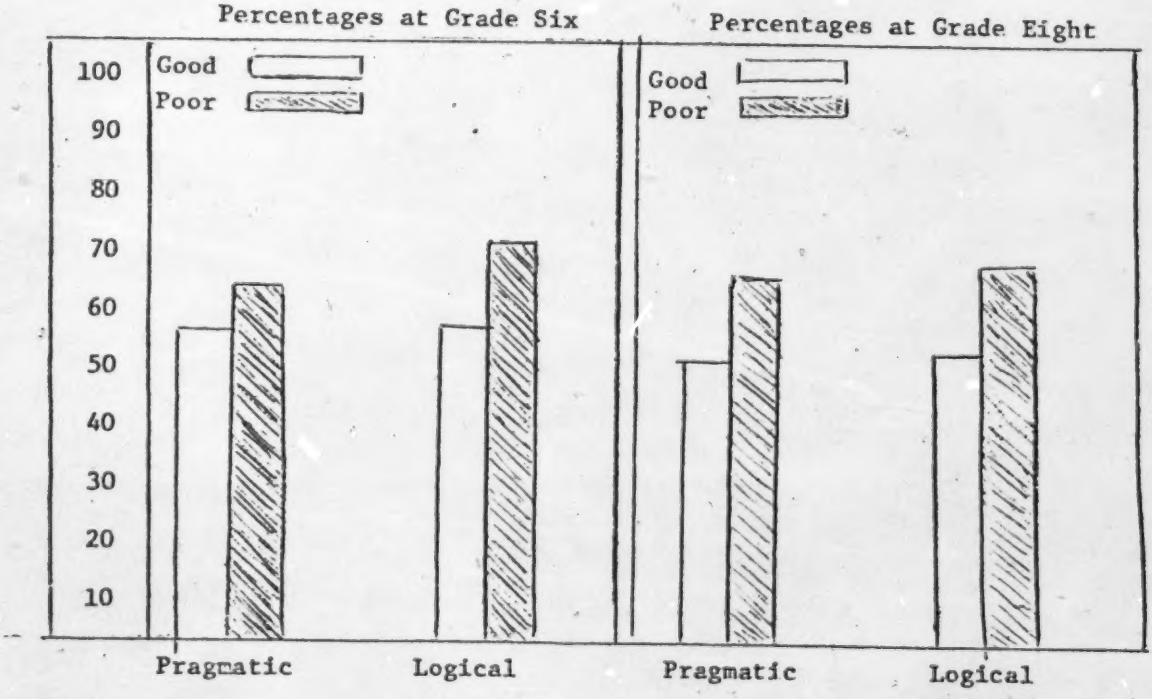

Fig. 2. Percentages of errors of good readers and poor readers due to incorrect choices on pragmatic and logical statements on 42 items.

Table II

Significant Differences in the Types of Errors of Good and Poor Readers at Grades Six and Eight After Partitioning (Castellan X^2)

Grade	Type of Statement	Item	Correct Response	Majority of Responses G.R.	Majority of Responses P.R.	X^2	Significance Level
6	Logical	1	NE	PF	PT	16.35	.01
6	Pragmatic	1	PT	T	NE	5.54	.05
		2	NE	PT	T	5.20	.05
		3	PT	PF	T	7.04	.01
8	Logical	1	T	PT	NE	21.74	.01
		2	F	PF	NE	5.43	.05
8	Pragmatic	1	NE	PT	F	5.21	.05
		2	PT	T	NE	8.15	.01
		3	PT	F	NE	14.60	.01
		4	T	PT	NE	11.53	.01

Table III

Percentages of Correct Responses to Statements Showing Greatest Differences Between Good and Poor Readers in Eighth Grade

Grade Eight

Statements	Total No. of Correct Ans.		Percentage of Correct Answers		Significant Level of Differences Between Percentages	
	Good Rdrs.	Poor Rdrs.	Good Rdrs.	Poor Rdrs.	X^2	Sign. levels
Pragmatic						
16. When there is more carbon dioxide in the air the climate is colder.	117	5	54.9	22.7	7.043	.01
26. Some of the old Roman roads are still in use.	122	10	93.8	77.3	5.570	.05
27. If the winters of Rome were more severe, the cement roads would not have lasted so well.	104	3	48.4	4.7	13.020	.01
39. The more carbon is in coal the more smoke it makes when it burns.	153	6	67.7	27.3	12.538	.01
41. Factory owners would like to use hard coal.	90	2	41.6	10.0	6.443	.05
Logical						
20. More can be learned by studying at home than by studying at school.	98	5	60.0	22.7	9.817	.01
31. Cement was discovered by an American scientist.	130	5	41.0	21.6	10.468	.01

Table IV

Percentages of Correct Responses to Statements Showing Greatest Differences Between Good and Poor Readers in Sixth and Eighth Grades

Grade Six

Statements	Total No. of Correct Ans.		Percentage of Correct Answers		Significant Level of Differences Between Percentages	
	Good Rdrs.	Poor Rdrs.	Good Rdrs.	Poor Rdrs.	X^2	Sign. level
Pragmatic						
26. Some of the old Roman roads are still in use.	61	47	80.3	62.6	4.972	.05
39. The more carbon there is in coal, the more smoke it makes when it burns.	49	20	66.2	27.8	20.117	.01
Logical						
11. Science can solve all of our food problems.	43	23	58.1	32.4	8.651	.01
23. Spelling is not well taught in most schools.	43	10	51.8	14.9	20.486	.01
35. Storms are more often destructive than useful.	36	16	48.0	22.5	9.233	.01
42. Soft coal is cheaper than hard coal.	65	38	86.6	52.1	19.339	.01

Table IV (Continued)

Statements	Total No. of Correct Ans.		Percentage of Correct Answers		Significant Level of Differences Between Percentages	
	Good Rdrs.	Poor Rdrs.	Good Rdrs.	Poor Rdrs.	X^2	Sign. Levels
Logical						
38. People like to live near factories that burn soft coal.	127	8	64.3	36.4	5.464	.05
42. Soft coal is cheaper than hard coal.	136	19	92.8	20.0	30.337	.01

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